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CHINA REPORT

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APPLIED SCIENCES

TECHNICAL, ECONOMIC INDICES REACH ADVANCED NATIONAL LEVEL

Kunming YUNNAN RIBAO in Chinese 31 Jan 82 p 1

[Article by Chen Xuecui [7115 1331 4733], Xu Desen [1776 1795 2773]: "Luxi Nitrogen Fertilizer Plant Learns Advanced Techniques With the Help of the Shanghai Coordination Group, Technical and Economic Indices Have Reached the Advanced National Level"]

[Text] Luxi County Nitrogen Fertilizer Plant conscientiously learned the advanced management experience and advanced technology in Shanghai with the help of the Shanghai coordination group. In December of last year, it produced 2,940 tons of chemical fertilizers a month at a cost of 100 yuan per ton. It consumed 1,667 kilograms of coal and used 1,253 kilowatt-hours of electricity. Not including subsidies, the plant earned a net profit of over 156,000 yuan, the best record in the history of the plant. The main indices for output, quality, consumption, cost and profit all reached the advanced level of similar plants in the same industry throughout the nation.

Luxi County Nitrogen Fertilizer Plant invited the Nanhui Chemical Plant and the Wusong Chemical Fertilizer Plant in Shanghai to send a special coordination group to come to the plant and help. The party organ of the plant mobilized the workers of the whole plant humbly to learn the advanced management experience and scientific technology of Shanghai. The comrades of the Shanghai coordination group conducted a conscientious survey and study and proposed 58 suggestions on rationalizing operations. Except 16 suggestions which could not be implemented at present because of the limitations of budget difficulties, 42 suggestions have been organized and implemented. Comrades of the Shanghai coordination group helped the plant popularize the various economic responsibility systems that have been effective in the Shanghai area, strengthened business management, taught technology, led in ideas and style of work, and served as personal examples. The standard of operation and the technical standards of the workers were improved. High output, low consumption, safety and various technical and economic indices all advanced to lead the whole province in joining the ranks of the advanced levels of the whole nation.

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CSO: 4008/104

POWER SYSTEM OVERCOMES DIFFICULTIES IN GENERATING ELECTRICITY

Kunming YUNNAN RIBAO in Chinese 2 Feb 82 p 1

[Article by Yang Liyi [2799 4539 5030], Yang Xuanmin [2799 6693 3046]: "Lift Up the Spirit and Energy, Overcome Difficulties To Seize High Yields, the Provincial Power System Generates and Supplies More Electricity in January"]

[Text] The broad number of cadres and workers of the provincial power system lifted their spirits, overcame difficulties, and exerted efforts in production. Up to January 29, they had completed generation of over 298 million kilowatt-hours of electricity, the highest level created during a similar period in the past.

Since last winter and this spring, our province has been in a season of drought. Water reserves are insufficient and hydroelectric power cannot generate more electricity. This has made the task of generating electricity by thermal power stations heavier. At the end of December of last year, the leadership of the Provincial Electric Power Bureau led the bureau's cadres in conducting surveys and studies, and held a system-wide cadres meeting. They conscientiously analyzed the production trends, and established concrete measures to guarantee completion of the task. After 1 January, the leadership of the bureau went, with members of related departments, to the localities to implement fuel supply and they guaranteed the need for coal by the various thermal power plants. At the same time, they conscientiously managed equipment repairs. In January, they inspected and repaired 23 boilers, 3 substations, 11 high voltage transmission lines, and created good conditions for safe generation and ample supply of electricity.

The cadres and workers of this system stood firmly at their work post in the spirit of being master, generated more electricity and supplied more electricity. Xuanwei Power Plant had a heavier task of generating electricity this year. The workers of the entire plant thought of many ways to develop potential. Besides inspecting and repairing the generators according to plan, all of the remaining generators were operating. In January, the highest daily output of electricity reached 3,812,000 kilowatt-hours, unprecedented during any similar period of the past. During the two holidays in January, the leading cadres of every production unit of the whole system joined engineering and technical personnel and insisted on working with the shifts to direct production. They have contributed to guaranteeing electricity for the whole province's industrial and agricultural production and electricity for people's living.

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APPLIED SCIENCES

CODING CHINESE CHARACTERS

Beijing JISUANJI YANJIU YU FAZHAN [COMPUTER RESEARCH AND DEVELOPMENT] in Chinese
No 1, 1982 pp 41-46

[Article by Xu Jialiang [6079 1367 2733] of the Tianjin City Scientific and Technological Information Institute: "Understanding Several Questions in the Study of Coding Chinese Characters"]

[Text] When we use a computer to process the information of written Chinese characters, we must first solve the problem of how Chinese characters can be entered into the computer. This means, we must solve the problem of how to digitize the information of Chinese characters and change the information into binary electrical signals. For this, people have used many different methods to convert the information of Chinese characteris into codes composed of Latin letters, Arabic numerals or other symbols, and have used these coded forms to enter Chinese characters into the computer. There must be a definite correspondence between the codes and the Chinese characters they represent. After Chinese characters are entered into the computer in coded form, throughput of computer processing must be orderly. At output, the Chinese character that has been entered first must be output first. This work is what people call "coding Chinese characters."

The study of coding Chinese characters is a key link in realizing computer processing of Chinese character information. Its importance is being understood by more and more people. More and more scientific and technical personnel and amateurs are participating in the study of this subject. According to our understanding, there are already over 100 Chinese character coding plans in China and abroad. These plans all have their own advantages. Some plans have already been tested in Chinese character information processing systems. Welcome results have been obtained. However, most of the plans, due to various causes, are still at a "planning" stage at present. On the one hand, the plans that are in the "planning" stage are being studied further in theory to make them perfect. On the other hand, various occasions are being used to advertize their superiority to attract the attention of concerned departments and to create conditions for on-line tests.

These different plans are categorized in Table 1.

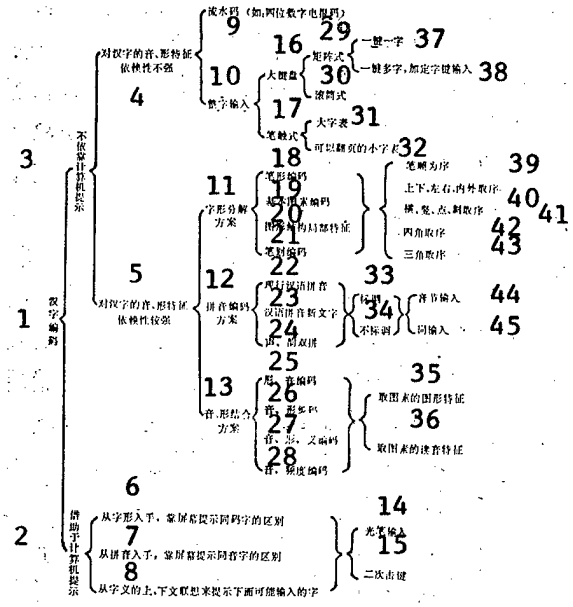
It is believed that, in the future, new plans will be proposed and there will be far more than those available at present. Then, how can the best plans be selected from among so many plans in the future? How should we establish the technical standards to judge the merits and demerits of these plans? Should Chinese character information input be mainly ideographic or mainly phonetic? What kinds of limitations exist in the present study of Chinese character coding? How can these limitations be overcome? From among these several hundred plans, should one plan be selected as the final one or should several plans be selected simultaneously? These problems face us and they need to be solved.

The above questions are mutually related and interwoven and they cannot be easily separated for individual discussion. I will talk about my shallow personal views regarding the above.

I. Comparison of the Coding Plans

Different situations in processing Chinese character information require different types of Chinese character coding schemes. The different situations in processing Chinese character information mentioned here include the following two aspects:

Table 1. Classification of Chinese Character Coding Schemes



Key:
1. Chinese character coding
2. Relying on prompts by computer
3. Not relying on prompts by computer
4. Not strongly dependent upon the ideographic and phonetic characteristics of Chinese characters
5. Relatively strong dependence upon the ideographic and phonetic characteristics of Chinese characters
6. Starting out from the ideographic form, relying on prompts on screen to differentiate between characters of the same code
7. Starting out from spelling, relying on prompts on screen to differentiate between homophones
8. Prompting possible input of characters by context
9. Continuous code (such as four-digit telegraphic code)
10. Whole character input
11. Scheme of separating parts of the ideographic form of the character
12. Spelling and coding scheme
13. Scheme of combining ideographic and phonetic characteristics
14. Light pen input
15. Double striking of keys
16. Large keyboard
17. Pen-touched

[Continuation of Key for Table 1]

18. Coding the shapes of strokes
19. Basic diagrammatic coding
20. Characteristics of partial diagrammatic structure
21. Coding the number of strokes
22. Current version of romanized spelling (pinyin) for Chinese characters
23. New romanized spelling of Chinese
24. Double spelling of phonetic and tone
25. Coding ideographic form and phonetic
26. Coding phonetic and ideographic form
27. Coding phonetic, ideographic form and meaning
28. Phonetic and frequency coding
29. Matrix
30. Roller
31. Large character table
32. Paginated small character table
33. Marked for tone
34. Not marked for tone
35. Taking the graphic characteristics of the ideogram
36. Taking the characteristics of pronunciation of the ideogram
37. One key per character
38. One key for many characters with additional character selection key input
39. In order of strokes
40. Ordering by up, down, left, right, in and out
41. Ordering by horizontal, vertical, dot, slanted strokes
42. Ordering by the four corners
43. Ordering by three corners
44. Syllabic input
45. Term input

1. Processing of Chinese character information has different purposes: communications, publication and printing, file management, information search, consulting service, translations between Chinese and foreign languages, etc. The different purposes will present different demands upon the method of Chinese character input, and the requirements of the various technical specifications for coding Chinese characters will also have different emphasis.

2. When processing Chinese character information, the equipment and conditions upon which it has to rely are different. The educational level and technical level of the operators are also different. All coding schemes are considered and designed for use on the computer, therefore, the schemes will make definite demands upon the equipment that is to execute them. Conversely, fixed conditions and ability of a computer limit and present definite demands upon the Chinese character coding scheme for that computer. In Chinese character information processing, the Chinese character coding scheme and the technical level of the computer are mutually dependent and mutually limiting. For example, if the capacity of the computer in use is small, its requirement for code length will be more outstanding. Again, for example, if the number of Chinese characters compiled is too large, the capacity of the computer must be large. If the computer used has complete functions and

strong functions, then the burden on the operator will be light. Conversely, if equipment of lower capabilities is used, the human operator's burden will be heavier.

Since different situations for Chinese character information processing present different requirements for the Chinese character coding schemes, when proposing one kind of Chinese character coding scheme we must first understand for which main purpose this coding scheme has been proposed. What are the demands upon the equipment it utilizes, and what are the demands upon the users and operators? Only with a clear understanding of the purpose and goals of the design, and with established technical conditions, can there be a basis for judging whether that scheme meets the expected goals. Otherwise, if the schemes are separate from their purpose and their working environment, and if various schemes are taken as is to serve as the criteria for comparison, the problems cannot be completely explained.

Any type of scientific research or design must have a written statement explaining such scientific research and its design or something similar. Even when such a goal is not issued by a department, we must establish a starting point for ourselves and propose a basic requirement and definite limiting conditions. Then we can begin scientific research or design. Research in Chinese character coding is also the same. Which equipment will your scheme be prepared for? Or, what kind of machine will you be relying on to realize your scheme? No matter how one considers the problem, one can only establish one condition and then seek a solution. One cannot study the problem universally. One cannot separate the problem from fixed material conditions (personnel, function of the machine and capacity, particular processing, etc.) in pursuing various kinds of lofty goals. Even computers have various models and various uses, let alone the Chinese character coding schemes for computers. How can we imagine there is an all-purpose "miracle drug"?

Some people believe that even though the equipment of the large keyboard whole character input method is large and more time is required to train the operator, it is superior in electronic phototypesetting. It is worth their while for professional typesetters to spend a certain amount of time in training to master it, and it is necessary that publishing and printing units acquire this type of equipment. In this special situation, people appreciate its direct visibility, its simplicity of operation and the few number of keying operations required.

In communications, the outstanding problem is accuracy and speed. The performance of such work as receiving and sending telegrams requires professional personnel. To the professional telegraph operator, it is absolutely necessary to spend a definite period of time in learning a new telegraphic code. Telegraph operators must memorize telegraphic codes and must use them skillfully. Whether it is a continuous code, an ideographic and phonetic code, a phonetic and ideographic code or a pure combined spelling code, people have higher demands regarding code length and the percentage of repeated codes, while the time required for training operators and other such goals are of secondary importance. In transmitting Chinese character information using computers, it is necessary to "see the character and recognize the code," while the necessity of "seeing the code and recognizing the character" is not great. This is because converting telegraphic codes into Chinese characters relies on the machine, not on manual labor. To be able to "see the character and recognize the

code" and also to be able to "see the code and recognize the character" are not demands upon Chinese character coding for the computer, but demands upon the person who translates telegraphic codes.

Codes based on ideographic form for input of lengthy texts of Chinese characters are more superior. The characters that appear in the text are directly input into the computer without going through a transition of phonetic spelling. The more intermediate links there are, the more chances there are that mistakes will occur. Ideographic codes can be free from the interference of regional dialects and dental sounds, and they will not be limited by inaccurate tones or unfamiliar words. Even people who cannot read Chinese characters at all will be able to input Chinese characters into the computer by this coding method based on ideographic forms. Because the level of the operator's knowledge of the Chinese language has been relaxed to a certain degree, specifications for code length cannot be strict.

In situations of information search and consulting applications, if professional service personnel must be relied on to communicate with the computer, then the specification for speed must be higher. The training time of professional personnel must be a secondary consideration. But, when setting up computer terminals for a massive number of user units (research institutes, factories, mines or higher educational institutions which require information searching), if one to two additional computer keyboard operators have to be added whenever a terminal is set up, it would not be economical and convenient. In this case, the ideal situation should be that everyone who searches for information can communicate directly with the machine and before they communicate with the machine they should not have had much training or should not have to have any training in Chinese character coding. At the same time, when conducting man-machine conversation, the burden upon the human brain must be as light as possible, Yet, to reduce the human burden, the tasks borne by the machine will have to be heavier. Lowering the requirements of the operator will increase the demands upon the machine. Under this situation, using the "prompt" function of the computer to "prompt" the Chinese character codes for the operator seems very necessary. If the man-machine conversation is "conversational" (or "question and answer"), input by spelling (pinyin) would be more direct than input by ideographic form. If all the information to be communicated by the machine had to be written in Chinese characters beforehand, then each Chinese character would have to be coded by looking at the shape of the strokes, and that would be too cumbersome. Even if the Chinese characters are not written out, every Chinese character has to be written in thought and its code has to be recalled mentally according to its strokes. In this way, the burden on the human brain will be very heavy, and this is not consistent with the habits of human "conversation." There are many difficulties. The coding scheme of "spelling - prompting" of Chinese characters has been proposed mainly for this situation.

In general, we cannot separate the schemes from the various goals of application and from the fixed conditions of the computer to simply compare the technical specifications of coding. The important thing is whether the scheme can realize the purpose for which it is intended at the time it is proposed, and whether manpower and material conditions can allow its realization. We can then select the scheme which has the highest coding efficiency, the one with the lowest percentage of repeated codes, and the one with the best performance under these prerequisite conditions.

II. Relationship between Ideographic Form and Sound

Should computer input of Chinese character information be based on form or on phonetics? This is determined by which form is used for input, and the purpose of input in such a form. This is based on the same reason that research cannot be separated from fixed and concrete conditions as discussed in the first part of this article.

Some comrades believe that since it is termed "Chinese character input" and "Chinese character coding," we must necessarily work on the Chinese characters. But any written Chinese character must be expressed by a fixed ideogram and, as a language, these characters must be based on ideograms.

This writer believes that the "written language" is a written expression of the form of a language. "Written words" and the basic unit "word" (i.e., syllable) of our Chinese language are not the same concept. The "word" in the language written on paper first expresses its form. When enunciated, the first expression is its sound. Ordinarily, we say that a certain person "enunciates clearly." Although this relates to the concept of "words," it does not refer to the "written word" that is written on paper and that has a fixed ideographic form. The illiterate can also "enunciate words." When two illiterates exchange thoughts, although the statements are composed of "words," these "words" do not include the concept of the graphic symbols of the written words during the course of exchange of thoughts. Before our ancestors created and used "written words," they had already been using a language with the "word" as the basic unit to engage in exchange of thoughts. Later, they recorded the "words" spoken by mouth onto oracle bones, bronze, bamboo slips, silk, paper, etc., and they used a fixed graphic symbol to record a fixed pronunciation and its meaning, and thus the "written word" was born. Therefore, exchange of thoughts between people need not be talking face to face. People could transmit or retain "words" of the language via a carrier of a fixed graphic language. The graphic language carrier is the means or tool for transmitting the "words" of the language, but not the only means. For example, after the telephone was invented, not everything had to be written in letters (This means, it was not necessary to go through the procedure of writing "words" of the language down on paper as "written words").

Conversation between man and machine follows this principle. Whether to input the "words" of the language directly (here we are not talking about the problem of voice recognition) or to input the written "words" depends on the need. Different needs determine whether the input should be based on phonetics or whether the input should be based on ideographic form. We must not separate it from the purpose and the conditions in use and abstractly analyze it. Like telephone conversation, it cannot replace writing letters and writing letters cannot replace telephone calls. Each has its usefulness.

The term "Chinese character coding" or "Chinese character input" is the name we have given to this work. Its nature is to study how man and computer can (using the Chinese character as the basic unit) converse in the Chinese language. It can never be separated from the true nature of the man-machine conversation to simply study

the written form of Chinese characters. Therefore, whether "Chinese character input" should be based on ideographic form or on phonetics cannot be limited to the name that we have used. This writer believes "Chinese character information processing" should be understood as computer processing of the body of written words of the Chinese language. It is not simply the processing of the written character that is written down and that has a fixed ideographic form.

Compared to the language systems of nationalities that already use completely alphabetized languages, the ideographic forms of the Chinese language indeed contain much more information than alphabetic languages. There are more difficulties in inputting the ideographic forms into the computer. This frequently makes people believe that Chinese character information processing is mainly processing of the information of the ideographic forms of the Chinese characters, and it is easy to start out by studying the ideographic forms of Chinese characters. Actually, neither studying phonetic representation nor studying ideographic representation should be abandoned. When inputting lengthy written texts into the computer, the first thing one comes into contact with is the "ideographic form" of the Chinese characters. When "conversing" with the machine involving questions and answers and where there is a strong randomness, the first reaction of the human mind is the sound and the meaning of each character. The reaction to the strokes and shapes of the characters is not fast. Therefore, different situations in use emphasize different aspects regarding whether to base input on phonetics or to base the input on ideographic form. Of course, it is entirely possible to establish a set of multipurpose Chinese character codes which can designate the same Chinese character whether the input is phonetic or ideographic. But this requires increasing the amount of work for the software and this will also present some special demands upon the machine. In general, consideration of the problem still cannot be separated from the purpose and the conditions in use.

III. The Question of Coding Efficiency and the Percentage of the Same Codes

Examination of the efficiency of coding and the percentage of the same codes also cannot be separated from the purpose and conditions of use.

Obviously, the shorter the number of bits of the code, the higher the efficiency of coding. Yet, the coding efficiency and the percentage of repeated codes are mutually limiting. Whether we start out from the radicals or from the strokes or from spelling in coding, the number of times a basic symbol is used in coding Chinese characters is different. In other words, regardless of which characteristic of a stroke we use or which characteristic spelling we use to categorize and queue Chinese characters, the distribution of Chinese characters is not even. Therefore, if we limit the length of the code, many Chinese characters with the same characteristic will be overly concentrated and, by necessity, they will have the same code. This means: Codes of definite length are not sufficient for differentiating the characteristics of these Chinese characters. Yet, if we divide these Chinese characters with the same code further, then we must add another code to designate their different characters, and thus the number of digits of the code will be increased. In this way, the percentage of the same code will be lowered, but for those Chinese characters that do not share the same code originally, this code seems too long. The digits of the codes would be wasted, and the coding efficiency is reduced.

The fact that no matter which characteristic of Chinese characters is used for classification, the distribution of Chinese characters with that particular characteristic is not even has determined that examination of the coding efficiency and the percentage of the same code must be combined. The requirements specified by the goal of coding and the possible equipment which the codes will rely upon must be combined to decide whether to place more emphasis on coding efficiency or the percentage of the same code, and to what degree such emphasis should reach.

Of course, using codes of unequal length to take care of both coding efficiency and the percentage of the same code is one way. Yet, when an operator follows a certain rule in coding Chinese characters for input, he cannot foresee whether this character shares the same code with another character and how many characters are sharing the same code. He cannot know whether to use more detailed rules to distinguish the characters sharing the same code. Certain special rules established for codes of different lengths (including rules for abbreviations) have to be memorized by the operator and this increases the burden on the human brain.

At present, when people examine the percentage of the same codes in coding Chinese characters, they frequently calculate it by counting the number of characters sharing the same code or the number of pairs of characters sharing the same code appearing in coding a fixed number of Chinese characters. In this method of calculation, every Chinese character is treated equally.

Yet, different Chinese characters have different frequencies of occurrence in use. The emergence of characters with the same code has a different effect when the same code occurs with commonly used characters or with rarely used characters. Therefore, the above method of examining the percentage of the same code is not very scientific.

Actually, certain situations can permit a small amount of characters with the same code to exist when coding Chinese characters. Whether in Chinese or in foreign languages, there are homonyms, heteronyms, words of the same form but different in meaning. In a sense, these are also the same codes. The phenomenon of having the same code in a language or a written language does not prevent Chinese or foreign languages from being used over long periods. Why is it intolerable to have a few characters with the same code in the study of coding Chinese characters? As long as the few characters with the same code do not cause misunderstanding and serious errors in use, is it therefore necessary that we be so technical and perfect?

Many comrades are using many methods in mathematics to study coding efficiency and the problem of the same codes in coding Chinese characters. They have accumulated much useful information and data for the study of Chinese characters. Basic theoretical research in coding Chinese characters is necessary for the design and implementation of coding schemes for Chinese characters. But, when it involves a certain coding scheme to actually code 10,000 Chinese characters or 4,000 commonly used technical Chinese characters, the number of characters with the same code can be counted easily. The coding efficiency is also easily counted and compared. In the course of designing a certain coding scheme, and when creating a Chinese character code dictionary, the problem of having the same code and the problem of coding efficiency will be manifested very clearly. The properties of every set of

characters with the same code must be concretely analyzed. The degree of occurrence of characters with the same code in the course of use must also be concretely analyzed. At the same time, we must combine the actual situation of use and the actual technological condition of the computer to determine the processing method.

IV. Breaking Away from the Limitations of the Method of Research of Coding Chinese Characters

The Chinese characters left us by our ancestors at first were not created for use solely by the computer. And neither was the presently available computer designed specifically for processing Chinese character information. Therefore, coding of Chinese characters cannot be a stubborn matching of certain characteristics of Chinese characters with Arabic numerals or Latin letters. This means, the connection between the characteristics of the sound and the ideographic form of Chinese characters and the coding symbol must not be forced. Otherwise, the codes would not be easy to remember and they would not be easy to use. In studying and designing various coding schemes, obstacles presented by the ideographic structure or phonetic structure of certain Chinese characters have been encountered. Some phenomena that have been difficult to handle have been encountered. Therefore, further reform of Chinese characters from different angles has been proposed. Because the understanding and the thoughts in the research of various types of codes at present are not unified, opinions on how to reform Chinese characters to realize the use of the computer to process Chinese character information have been difficult to unify. They are still far away from forming a force that can influence the direction in the development of the work of reforming Chinese characters. Also, the problems involved in the work of reforming Chinese characters are more difficult than the work of coding Chinese characters. The research in coding Chinese characters will serve to promote the work of reforming Chinese characters, but it will never replace the work of reforming Chinese characters. Coding Chinese characters must not be done by "cutting one's feet to fit the shoes." Of course, defects that truly belong to the feet should be treated, but requirements must also be made upon the "shoes" that are to be worn. To realize the use of computers to process Chinese character information, we must not only have the efforts of comrades engaged in coding, we must also have the common efforts of comrades engaged in computer hardware and software. To realize the goal of Chinese character information processing by computer, can we make certain demands upon computer hardware and software? Can we develop a computer language based on the Chinese language system? When we design coding schemes, why do we have to limit ourselves to the presently used Latin letter keyboards? For example, would developing a fixed keyboard of initial consonants and compound vowels for Chinese eliminate the necessity of the operator having to memorize the double spelling rules? Using the computer's "prompt" function, we can let the computer prompt the codes that differentiate between characters of the same codes, and will this not reduce the mental burden on the operator? In certain situations where the speed of input of Chinese characters is not overly emphasized, fully utilizing the computer's potential to add a buffer between man and machine and develop a second input is feasible.

Although Chinese characters at first were not created for today's computers, and the present computers were not specifically built for Chinese characters, the study of coding Chinese characters must go beyond the simple method of studying Chinese

characters for the sake of Chinese characters. Coding Chinese characters must not be done by drawing one's own "prison walls." We should not be afraid to step outside the circle of studying Chinese characters just because we are engaged in "Chinese character coding." The study of Chinese character coding should be combined with the study of the main frame of the computer and peripheral equipment, and it should be combined with the study of computer software. We should utilize computer equipment and technology as much as possible so that when people use this coding scheme to input Chinese characters, the mental burden can be lessened so that the goal will be consistent with the goal of using the computer to process Chinese character information (we must not let the brain work as a tired "decoder").

To make new progress in the work of Chinese character information processing, certain limitations now present in the method of studying Chinese character coding must be broken.

V. Chinese Character Coding Must Combine Three Aspects

Chinese character coding work must be a three-way alliance of the user, the coding personnel and computer personnel. At present, relying on written or verbal arguments to prove the superiority of a certain coding scheme is far from enough. We must grasp on-line tests and we must grasp the study of auxiliary equipment and software research. No matter how, we cannot let the coding of the shapes of strokes lag behind the use of the computer in recognizing the ideographic forms of Chinese characters. We cannot let the study of phonetic coding lag behind the study of using the computer to accept Chinese voice input. We cannot let the study of differentiating between characters of the same code lag behind the study of artificial intelligence in computers so that the computer can recognize characters of the same code by context.

The present Chinese character coding work is mostly conducted by enthusiasts during their spare time. Although the enthusiasm of spare-time research is precious, efforts that always remain as spare-time efforts will not benefit new breakthroughs in the study of Chinese character information processing because a person's energy is limited. Within a definite time, specifically arranging a fixed number of people and materials to combine the advantages of all the schemes and to produce several coding schemes suitable for different situations is very necessary. Also, in such research and experiments, there must be users of various types of computer systems.

Research combining these three aspects not only will benefit the progress in the study of coding Chinese characters, but it can be believed that it will also serve to push forward our nation's scientific research, design and applied technology in computers.

VI. Selecting the Best Coding Scheme

To avoid repetition and waste, and to hasten the progress in research, the presently available Chinese character coding schemes must be categorized, summarized and screened.

The purpose of screening the schemes is not to arrange the schemes in order of superiority or inferiority (and, in addition, schemes used for different purposes and different situations cannot be placed together and ranked), but to find the advantages and the shortcomings of each scheme so that the advantages of each can be combined to make up for the shortcomings of each and to develop several coding plans that suit China's situation and that have different uses. Therefore, the limitations of the authors of different coding schemes must be broken. The traditional method of research, like small handicraft production, must be broken.

As long as we keep in mind a clear goal of selecting the best and the objective criteria of not separating the schemes from the purpose and situation in use, then in the screening process we can eliminate man-made factors of interference to the maximum extent.

Selecting the best must not only be done in theoretical specifications, we must also select the best in practice. The proposers and researchers of all kinds of schemes can all argue the superiority and inferiority of the schemes, but the users of various applications systems will have more say in the conclusion from the user's viewpoint. Therefore, just the proposers and researchers of coding schemes cannot sufficiently constitute the entire membership of the organization to evaluate and select the schemes.

VII. Chinese Character Coding and Chinese Character Information Processing

The subject of computer processing of the Chinese language system requires a systems engineering point of view. Although Chinese character coding is one key link, it is only a very small prelude to the entire process. Simply entering the codes at one end and printing out or displaying corresponding Chinese characters cannot constitute complete success in computer processing of Chinese character information. A lot of work has to be done in computer software, peripheral equipment and in the computer mainframe. To enable the Chinese characters entered into the computer to be connected in syntex within the machine, to enable the computer to understand the linguistic structure of Chinese and automatically process the input information, a lot of research and exploration is still required. This work is more difficult and more complex than defining codes for every Chinese character. There is a lot to be done in the Chinese character input keyboard, the means of displaying Chinese characters and the means of printing Chinese characters. In general, each link in the system is indispensable. There is an organic connection between every link and every other link. To realize automation of Chinese character information processing soon, comrades engaged in computers should understand more about the research in coding Chinese characters. And comrades engaged in coding Chinese characters must understand more about the computer.

9296
CSO: 4008/110

RESEARCH COMBINES WITH PRODUCTION, SERVES ECONOMIC READJUSTMENT

Guangzhou GUANGZHOU RIBAO in Chinese 12 Feb 82 p 1

[Article by Ye Lihan [5509 7787 7281]: "Scientific Research Combines Closely With Production, This Promotes Production and Enlivens Scientific Research, Last Year, 34 Scientific Research Achievements Began Production in the City's Industrial Frontline, Creating Over 50 Million in Production Value, Funds for Scientific Research Were Replenished, and This Promoted the Development of Scientific Research Work"]

[Text] Our city's scientific and technological work has been closely combined with production to serve economic readjustment. The achievements increased over those of the past and began production more quickly. According to incomplete statistics, last year alone, our city's industrial frontline popularized and began production of 34 scientific research achievements, creating over 50 million yuan in production value and realizing a profit of over 10 million yuan.

Insisting on applying scientific research, starting out from the actual situation, following the policy of mainly developing light and textile industries in our city's buildup, and arranging production projects according to social needs are the main reasons that our city's scientific research work is active. The Guangzhou Chemical Engineering Institute completed a total of 125 scientific research projects since its inception to 1979 but only 36 achievements were produced and applied, or only 28.8 percent. After implementing the readjustment policy, projects of study were selected by starting out from practicality, and as a result, last year, 11 projects were completed, and 10 of them were popularized and applied. Since last year, this institute developed 590,000 spare and accessory parts of 64 types in 15 major categories for the textile industry, the sewing machine industry, electric fan and television manufacturing. The institute has contributed to the development of our city's industry.

Technical joint ventures and cooperation between scientific research units and production departments are an effective way. At present, our city implements technical joint ventures mainly in four ways: The first is to sign technical contracts. After the scientific research unit completes the commissioned projects, the commissioning agency pays the scientific research fees. The second is the joint development of new products by the research institutes and

the factory. Scientific and technical personnel go the factories to work together with factory personnel and help solve actual problems in production and develop new products. The third is the establishment of fixed cooperative relationships between the scientific research units and the production departments and signing of a joint venture agreement in technology. For example, the Xinbang County Fruit Trees Research Institute, the country's fruit company, the supply and marketing cooperative and the local production brigade jointly established an experimental fruit farm to cooperate in technology, production and capital investment. The income was shared proportionally by the units. The fourth is combining the factories and the institutes to establish a joint scientific research and production entity mainly engaged in scientific research, such as the joining of the city's Pharmaceutical Plant No 9 and the city's Pharmaceutical Industry Research Institute so that research and production can become one entity.

The close combination of scientific research and production has hastened the speed of scientific research projects conducted by scientific research units, and the funds for scientific research by scientific research units have been replenished, thus promoting the development of scientific research work. The city's Automatic Control Research Institute has taken the initiative in joining the factories and enterprises over the past 2 years. It has signed 13 contracts of technical joint ventures with production departments. Seven projects have already been completed and have been handed over for use. The income amounted to over 300,000 yuan. This has enlivened scientific research work at the institute.

The combination of scientific research and production has forcefully promoted the development of production. The city's Rubber Research Institute has closely joined the production needs of its own industry for several years to develop research. It has contributed greatly to our city's rubber production. The institute helped the 13th Rubber Plant apply and popularize the technique of extender synthetic rubber. The percentage of extension increased from 30 percent to 40 percent. The plant increased its revenue by 470,000 yuan within half a year. The institute also helped the Third Rubber Plant solve the technical problems in manufacturing plastic basketballs. This product won the silver medal in the national quality evaluation last year. The factories of the rubber manufacturing sector commented that the work of the rubber research institute has become a helpful vanguard in our development of rubber production.

9296
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CHINESE SEMICONDUCTOR PROGRESS

Beijing DIANZI SHIJIE [ELECTRONIC WORLD] in Chinese No 12, Dec 81 pp 2-3

[Article by the Department of Devices, Chinese Radio Equipment Company: "Development of Semiconductor Integrated Circuits in Our Nation"]

[Text] Since the advent of integrated circuits at the end of the 1950s, there has been a history of only 20 years of development. But they have served very importantly in modern science and technology and they have made important contributions to mankind. In the 20th century, man has landed on the moon, launched spacecrafts that travel to Venus and Mars and even to further star systems. Man has developed legend-like offensive, interception and defensive systems in electronic warfare, very capable robots used in modern and highly automated mass production, electronic devices that have penetrated all realms of human society, and even microprocessors that can replace housewives.... All these are miracles that have occurred only after the advent of the integrated circuit. Therefore, the level of development of integrated circuitry has already become an important indicator to measure the level of modernization of a nation.

China began developing integrated circuits at the beginning of the 1960s. In 1965, the first integrated circuit was successfully developed. Now, our nation can manufacture over 500 varieties, with an annual output reaching 40 million units. But the proportion of the world output (in 1979, this had reached 6.1 billion units) is still very small, and most of the units are still medium- and small-scale circuits. In large-scale integrated circuits, a test production line with a definite percentage of final products has already been established for 1024-bit and 4096-bit random memory units.

There are many types of integrated circuits. According to circuit structure, they can be divided into the bipolar type and the MOS type. According to circuit functions, they can be divided into digital circuits and analog circuits. According to the scale of integration, they can be divided into small-scale, medium-scale, large-scale and superlarge-scale circuits.

At present, there are seven categories of semiconductor integrated circuits being produced and developed on a trial basis in China. The are separately described below:

1. TTL Circuit

This is a transistor-transistor logic circuit that is widely used in our nation. It constitutes about 50 percent of the total domestic production. There are a total of five series. The major producers are the Beijing 878 Plant, the Changsha 4435 Plant, the Second Beijing Semiconductor Devices Plant, the Sixth Plant, the Tianjin Semiconductor Plant, the Shangwu 19 Plant, the Shanghai 8331 Plant, the Changzhou Semiconductor Plant and the Suzhou Semiconductor Devices General Plant.

(1) T000 Series This series basically follows the design of the series 74 products of the Texas Instruments Company of the United States. The design started out from the actual situation in China and the various parameters are slightly lower than those of the 74 series. This series includes 28 types of medium-speed small-scale circuits, 26 types of high-speed small-scale circuits and 61 types of medium-speed medium-scale circuits.

(2) T1000 Series This series is completely the same as the SN74/54 series products of the Texas Instruments Company of the United States. There are a total of 101 varieties of medium- and small-scale circuits. Their logic functions are more complete and they can satisfy whole machine logic design requirements.

(3) T2000 High Speed Series This series has been developed as a copy of the American SN74H series. It uses a shallow saturation structure. A total of 23 varieties has been selected.

(4) T3000 Very High Speed Series This series has been developed as a copy of the American SN74S series. It is a Shockley anti-saturation circuit. A total of 58 varieties has been selected and the series is a key series for development in our nation.

(5) T4000 Low Loss High Speed Series This is a product that imitates the American SN74LS series products. A total of 109 varieties has been selected. This is a circuit that urgently needs to be developed in China. At present, it does not have a fixed product type.

2. HTL Circuit with a High Resistance to Interference

This series is similar to Japan's Toshiba products. The resistance to interference can reach 6 volts. There are a total of 16 types, including 11 types of gate circuits and 1 type of trigger, and 4 types of medium-scale counting, decoding and memory circuits. They can basically satisfy the designed requirements for industrial control machinery. The main production plant is the Third Beijing Semiconductor Devices Plant and the Nantong Transistor Plant.

3. ECL Ultrahigh Speed Counter Circuit

The domestic ECL circuit is designed mainly on the basis of the MC10100 series and the MC10500 series of the Motorola Company of the United States. The average gate delay is generally smaller than 2 millimicroseconds and it is less than 0.7 millimicrosecond for submillimicrosecond products. The circuit is mainly used in large

and super-large high-speed computers, space flight and satellite communications equipment and microwave measurement devices. The main production plant is the Qinan 871 Plant.

4. PMOS, NMOS Circuits

The PMOS circuit is simple in structure, its degree of integration is high, and its cost is low. In 1980, total sales by all plants reached 2.5 million units. Domestically it is mainly used in desk-top computers and numerical control devices. Because PMOS is low speed, its power consumption is large, the voltage of the power source is high and its development is limited. The main production plants are the Fifth Shanghai Elements Plant, the Nantong Transistor Plant and the Fifth Beijing Semiconductor Devices Plant.

Except for individual varieties of NMOS circuits, most NMOS circuits are single power source circuits with a power source voltage of +5 volts, compatible with TTL circuits. The input and output are also compatible with TTL circuits. In addition, the speed of NMOS is fast, power consumption is small, therefore, it has developed rather quickly in recent years. In particular, medium- and large-scale circuits mostly utilize NMOS circuits. The main production plants are the Shangwu 14 Plant and the Beijing 878 Plant.

5. CMOS Circuit

The manufacturing techniques of the CMOS circuit are more difficult. Its production in China began rather late. But at present, our nation can provide more than 70 varieties, including such products as the 1-bit microprocessor, electronic watch circuit, analog-digital converter, locked phase ring and voltage comparer. Because of its minimum power consumption characteristic, it has been widely used in portable meters and electronic instruments in space flight. The main production plants are the Shangwu 14 Plant, the Third Beijing Semiconductor Devices Plant, the Fifth Shanghai Components Plant, the Nanchang 746 Plant, the Changzhou Semiconductor Plant and the Suzhou Semiconductor Devices General Plant.

6. Analog Integrated Circuit

This type of circuit includes various interface circuits and linear circuits. Interface circuits refer to circuits that perform electrical level conversion and signal conversion to adapt to load requirements and to realize different types of signal conversions, such as for peripheral drives, read-out amplifiers, analog-digital or digital-analog converters. Linear circuits mainly include various types of computational amplifiers, integrated voltage stabilized power source and time-based circuits. The computational amplifier is an important field of linear circuitry. The domestic integrated computational amplifiers include not only the general purpose types I, II and III computational amplifiers, but such products as low power loss computational amplifiers, high speed computational amplifiers, high precision computational amplifiers, high voltage computational amplifiers, single power source computational amplifiers, wide band computational amplifiers and low noise computational amplifiers have continued to emerge. The computational amplifier is used in analog computers for integration, differentiation, addition, subtraction,

multiplication, division, logarithms and exponential computations. It is also used in electronic equipment for precise measurements, power source control, communications, information processing, and as part of switches, amplifiers, comparers, source wave filters and function generators. It is a multipurpose integrated circuit.

The integrated voltage stabilized power source is one of the important products of the linear circuit. Its function is to control output voltage fluctuation to less than 0.1 percent when the voltage over the power network fluctuates or when the load changes so that a stable power source voltage can be provided across the power line or for the entire machine.

The 555 time-based circuit is a type of time control circuit, therefore it is also called a timer. Although the time control circuit can also be constructed using a gate circuit and a single state stable trigger, such a circuit is not as convenient as the 555 time-based circuit which has high precision, strong versatility and which is suited for several hundred types of applications. Almost all foreign semiconductor manufacturers have such products and the model numbers all include the three numbers 555. Because this type if circuit has a broad range of application, it helps to solve many difficult problems in past circuitry designs, and therefore its production value is very high, ranking third among linear circuits, next only to the computational amplifier and the stabilized voltage power source. The main production plants are the Beijing 878 Plant, the Qinan 749 Plant, the Beijing Semiconductor Devices Institute, the Sixth Beijing Semiconductor Devices Plant, the Fifth Shanghai Elements Plant, the Seventh Shangwu Plant, the Shanghai 8331 Plant and the First Wuxi Elements Plant.

7. Special Circuits

These refer mainly to the television circuits, radio circuits, circuits in recorders, circuits in electronic watches, computer circuits, audio circuits and microprocessor circuits.

There are six series of television circuits: (1) color television and large screen black-and-white television circuits (TA series); (2) first type of small screen black-and-white television circuits (P24 series); (3) second type of small screen black-and-white television circuits (Sanyo triple-circuit series); (4) first type of circuits imitating the West German 5010 color television circuit (X series); (5) the second type of circuit imitating the West German 5010 color television circuit (7CD series); (6) black-and-white television circuits (5G series). At present, the P24 television circuit can be batch produced. The main production plants are the Wuxi 742 Plant, the Seventh Shangwu Plant and the Fifth Beijing Semiconductor Devices Plant.

The recorder circuit is mainly a sound frequency power amplifier circuit. There are a total of four types, three of which are imitations of the LA4100, LA4101 and LA4102 products of the Sanyo Company of Japan. The other type is an imitation of the TBA810S product of the Fairchild Company of the United States. The output power is, respectively, 1W, 1.5W, 2.1W and 4.2W.

Audio circuits have just begun trial development and production in China. They mainly include the following: (1) frequency modulated and amplitude modulated medium frequency amplifier circuit; (2) frequency modulated stereo demodulator circuit; (3) sound frequency power amplifier circuit; (4) amplitude modulated receiver circuit system; (5) low noise sound frequency preset amplifier circuit; (6) multifunctional audio circuits.

At present, the development of foreign microprocessors is very rapid. They have developed from 1-bit, 4-bit and 8-bit processors to 16-bit processors, and 32-bit processors are being developed. The development of microprocessors in China is actively being carried out and the 1-bit, 4-bit and 8-bit microprocessor circuits have already been developed. The 1-bit microprocessor is an imitation of the American MC14500 single board processor. The major functions are to complete logical decisions and conditional decisions, to realize sequence control, conditional control, fixed time control, counting control, pulse input control and many types of program control. The 1-bit processor is manufactured by the CMOS technique. It has a low power consumption, its resistance to interference is strong, and its range of operating voltage is broad. The main production plants are the Fifth Shanghai Elements Plant and the Third Beijing Semiconductor Devices Plant. The 4-bit processor was developed by copying the SM-2 product of Japan. It is mainly used in engineering calculations, intelligent meters and simple controllers. At present, two series are being test produced using the P-channel silicon grid E/DMOS and the P-channel aluminum grid E/DMOS techniques, i.e., the 040 and the 041 series. According to the technical and technological levels in China, the 4-bit processor uses the multiple-chip structure, which is divided into the CPU_1, CPU_2, ROM, RAM and display oscillator. This is relatively easy to realize and it has a greater flexibility. According to our understanding, there are many types of foreign 4-bit microprocessors and, at present, there is no trend toward standardizing them. In recent years, foreign nations have widely utilized the CMOS technique. We will also develop the CMOS 4-bit microprocessor on the foundations of the P-channel E/DMOS. The main production plant is the Wuxi 14 Plant.

China has selected the two representative series of 8-bit microprocessors, the 8080 series by the Intel Company of the United States and the 6800 series by the Motorola Company. In China, they are designated as the 050 series and the 060 series. At present, they have been successfully test developed and whole processors have been assembled in China. There are 16 varieties of the 050 series and 7 varieties of the 060 series. These two series are single chip CPUs, but we have also developed a few interface circuits. The main production plants are the Fifth Shanghai Elements Plant, the Wuxi 19 Plant and the Changzhou Semiconductor Plant.

The above is a brief description of the production and development of China's integrated circuits. We are confident that, as science, technology and socialist buildup develop, scientific research and production of integrated circuits in China will surely realize even more rapid development and their applications will become broader.

9296
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SYMPOSIUM OF CHINESE SOCIETY OF MARINE , FRESHWATER CHEMISTRY

Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 13 No 1, 1982 pp 102-103

[Article by Li Peiquan [2621 1014 3123]: "Symposium on Oceanographic and Limnological Chemistry Is Held in Qingdao, Chemical Society of the Chinese Oceanography and Limnology Society Is Officially Founded"]

[Text] The Chinese Oceanography and Limnology Society held a "Symposium on Oceanographic and Limnological Chemistry" from 22 to 26 August, 1981, in Qingdao. At the same time, the "Chemical Society of the Chinese Oceanography and Limnology Society" was founded. Attending the symposium were nearly 100 delegates from 26 units subordinate to the Chinese Academy of Sciences, higher educational institutions, the National Oceanography Bureau, the Second Ministry of Machine Building, the Ministry of Health and other departments. A senior in the field of chemistry, Professor Liang Shuquan [2733 2885 2938], who is a member of the Academic Department of the Chinese Academy of Sciences, and Professor of Academic Chemistry Wang Mingde [3769 2494 1795] attended the symposium. Executive Assistant Director of the Chinese Oceanography and Limnology Society and Assistant Principal of the Shandong Oceanography Academy, Professor Hao Zongben [6378 1504 2609], delivered the opening remarks. Deputy Secretary of the Party Committee of the Oceanography Institute of the Chinese Academy of Sciences and Executive Assistant Director Comrade Yang Jingren [2799 2417 0088] enthusiastically expressed his support and congratulated those at the meeting. After the opening ceremony, the first board of directors of the Chemical Society of the Chinese Oceanography and Limnology Society was chosen by democratic discussion and election. The board consisted of 34 members. Ji Minghou [4764 2494 0230] served as chairman of the board, and Li Faxi [2621 3127 6007], Sun Yushan [1327 3768 0810], Wang Lijun [3769 7787 0689], Hui Jiayu [1920 0857 3768] and Mo Jinhuan [5459 6855 1854] served as vice chairmen. The conference chose the three professors, Liang Shuquan, Chen Guozhen [7115 0948 3791] and Shen Panwen [3947 3140 2429], as honorary chairmen. Professor Liang Shuquan reported on the problems related to the present progress in analytical chemistry at the conference. He pointed out that the individual emergence of emphasis on instrumental analysis and the neglect of chemical analysis in the present field of chemistry are incorrect. His remarks attracted the attention of attending delegates. Professor Ji Minghou reported on the activities of foreign nations in the study of oceanic humus. The report entitled "Microcosmic Research in Oceanic Chemistry" by Assistant Professor Zhang Zhengbin [1728 2973 2430] described in an overall manner the achievements in recent years of our nation's microcosmic research in oceanic physics

and chemistry. Other who presented reports at the conference included comrades Gu Hongkan [7357 1347 1030], Chen Banglin [7115 6721 2651], Ji Zhengxun [4764 2973 6064], Han Wuying [7281 0582 7751], Liu Quxia [0491 5900 7209] and Hu Wenying [5170 2429 5391]. They presented special topic reports on the distribution of trace amounts of metallic ions in water, extracting uranium from sea water, the Pb method to study the rate of sedimentation, deep sea surveying, chemical characteristics of lakes on plateaus and the water in Donghu in Wuhan. Attending delegates were greatly inspired. The conference received a total of 85 papers. After the conference, three groups were organized for group reports and discussion according to specific fields of specialization in geochemistry and physical chemistry, analytic chemistry and resources chemistry.

The analytic chemistry group presented 20 papers, and proposed many new methods and new instruments suitable for research in oceanographic and limnological chemistry. The delegate from the Shandong Medical Science Research Institute reported on the method of using the Ge(Li)γ spectroscope to directly determine nucleins, and he reported on the survey of the five types of nucleins (U, Ra, Th, ^{40}K and ^{137}Cs) found in the coastal sediments in Bohai jointly carried out by them and the Oceanography Institute of the Chinese Academy of Sciences. The development of the Hy-814 digital spectrophotometer by Xiamen University attracted a lot of interest among participants. In addition, innovations and improvements were reported by papers on many analytical methods, such as the use of cold atomic fluorescence to measure mercury; the use of extraction, vapor phase, spectroscopy, atomic absorption methods to measure trace elements in sea water, living organisms and sediments and sugars in ocean algae; the use of the automatic analyzer to measure the content of ammonia and nitrogen; the development of potassium and sodium ion selecting electrodes; fusion technique in sample processing and analytic methods of radioactive isotopes ^{3}H, Th, U, ^{131}I, ^{239}Pu, ^{210}Po in sea water.

The geochemistry and physical chemistry group presented a total of 22 reports. The reports on the application of the three-dimensional method to the atomic absorption method, and on the presence of dissolved forms of hydroxyl complexes and chlorine complexes of heavy metals in trapped water have definite theoretical and practical value. The conference also reported on the results of research in the distribution and the chemical forms of trace elements, nutritive elements, heavy metals, arsenic, isotopes, rare earth elements and organic farm chemicals in the bodies of organisms, in suspended granules, sediments, and bodies of water in Donghai, Nanhai, Dayehu, Jiaozhouwan, Zhujiangkou, Bohaiwan, Fozhiling Reservoir, Donghu and Honghu, as well as questions related to the draining of pollutants into the oceans and lakes and evaluation of water quality. Definite achievements have been made in the study of such organic substances as amino acids and organic carbon in sea water, and in the study of the separation of humus in sea water and fresh water and its complexes. These have been new fields of research begun for the first time in our nation in recent years.

The resources chemistry group presented seven reports. Good progress has been realized in overcoming the problem of the influence of temperature upon the adsorption rate in the improvement of the conditions for preparing the titanium adsorbent in the study of extracting uranium from sea water. In addition, more profound exploration was conducted in the study of the physical and chemical characteristics

and the mechanism of the adsorbent. The other papers on the preparation of magnesium sand from low boron sea water, the study of extracting bromine from sea water, and the study of property changes in agar gel all provided basic methods and information for production.

In the overall view, the content of the papers was rich. The depth and broadness of research had not been seen before. This indicates that the standard of research in our nation's oceanographic and limnological chemistry has been greatly elevated. At this conference, some research achievements resulting from mutual penetration of different sciences and mutual cooperation were seen.

The conference implemented the policy of "letting a hundred flowers bloom and a hundred schools of thought contend." The enthusiastic discussion, the honest conversation and the rich democratic atmosphere greatly impressed the participants.

9296
CSO: 4008/113

AUTHOR: Yi Min [0044 3046]

ORG: None

TITLE: "Scientific Symposium on Basic Problems (Concepts) of Laser"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 1, Jan 82 pp 17, 37, 52

ABSTRACT: On 5-15 Sep 81, A Symposium on Basic Problems (Concepts) of Laser was held in Taiping County of Anhui Province. The symposium was organized by the Department of Physics, Chinese University of Technology, after accepting a request by the Laser Specialty Committee of Chinese Society of Optics. Participants included 65 delegates representing 40 organizations all over the country. After 34 persons-speeches, it was divided into 2 groups for discussion, centering upon the following 8 categories: (1) Thermodynamic description of the laser process; (2) Nature and parameters of Light Amplification by Stimulated Emission of Radiation; (3) Threshold conditions of laser production; (4) Ultra-short pulses; (5) Physical mechanisms of laser production or high-coherence light radiation (including X-laser, etc.); (6) (6) Optical resonant chamber and its modulo distinction; (8) Coherence, isotopic phase, noise, and oscillation spectral line width; (9) Nonlinear optics. Viewpoints concerning these subjects exchanged at the conference are briefly mentioned.

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ORG: None

TITLE: "Second National Optical Information Processing Symposium"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 1, Jan 82 pp 27, 47

ABSTRACT: The Second National Optical Information Processing Symposium, held on 8-13 Sep 81 in Qingdao, was organized by Beijing Institute of Physics, Changchun Institute of Optical Devices, and Shandong College of Oceanography, by the request of Chinese Society of Optics. A total of 81 delegates and 23 alternates attended, representing 50 organizations of the National Science Committee, Chinese Academy of Sciences, schools of higher education, and departments of industries. Of the 120 papers submitted, 80 were delivered during the meetings. Deputy Chairman WANG Zhijiang [3769 0037 3068] reported on the Current Condition and Prospects of Optical Data Processing and Deputy Director HUO Yuping [7202 0060 1627] of Hefei Plasma Rsearch Institute reported on Spatial Variable Coherent Light Exchange. Ten others also delivered reports. Compared with the First Symposium (1979 in Chengdu), both the quantity and the quality of the papers are better. The delegates unanimously resolved that the next symposium should be called in 1983.

AUTHOR: YI Min [0044 3046]

ORG: None

TITLE: "The First National Symposium on Laser Engineering Applications Held in Leshan of Sichuan Province"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 1, Jan 82 p 91

ABSTRACT: China's First National Laser Engineering Applications Symposium was held from 29 Oct to 3 Nov 81 in Leshan of Sichuan Province. Participants included 204 delegates from 10+ provinces and cities, and 6 invited reports and 108 submitted papers were read. They reflect the progress of research studies on applied laser devices in China. The intermediate and small power laser devices are developing in the direction of miniaturization. Progresses have also been made, in various degrees, in such aspects as laser range finding, graphic data recognition, solid mechanical testing, information transfer, heat treatment, etc. Judging from these papers, the level of laser engineering applications in China remains somewhat behind that of foreign countries. There are still few blanks and the progress of relatively complex items is rather slow. More efforts are definitely needed.

6168
CSO: 4009/297

AUTHOR: YU Baoyu [5713 1405 3558]

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TITLE: "The Chlorination Kinetics of Oxides of Fe. Mg, Ti and (Fe, Mg)TiO_3"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese No 4, Apr 82 pp 164-175

TEXT OF ENGLISH ABSTRACT: The equilibrium diagram for Fe-Mg-Ti-O_2-Cl_2 system at 1123K was constructed based on thermodynamic calculation, and then an attempt was made, by selective chlorination, to yield synthetic rutile from ilmenite with high Mg content (Fe, Mg)TiO_3. The chlorination kinetics of Fe_2O_3, MgO, TiO_2 and ilmenite have been mainly studied using Cl_2-CO and Cl_2-C at 400-950°C. It resulted in the chlorination process of simple oxide being under chemical reaction control, while that of ilmenite was dependent on the ash layer diffusion. It seems to be difficult to get a high selectivity of FeO, MgO to TiO_2 in the fluidized-bed chlorination of high Mg ilmenite (Fe, Mg)TiO_3 with solid carbon reductant due to the thermodynamic and kinetic limitations. The "low temperature effect" and catalysis of $FeCl_3$ found in the chlorination process were also discussed.

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LIANG Juanqiu [2733 1227 4428]
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TITLE: "A New Chelating Extractant--H106"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese No 4, Apr 82 pp 221-234

TEXT OF ENGLISH ABSTRACT: The stability of a new hydroxamic acid type chelating extractant, H106, and its extraction chemistry have been investigated. After 50 extraction-stripping cycles its loss is very little, and after a long-term aeration test in HNO_3 medium its stability is satisfactory. In H_2SO_4 solution, Ga and Ge may be perfectly separated and recovered by co-extraction and respective stripping. The extraction of group IV or V elements in HCl with H106 was available at their own appropriate acidity.

The mechanism of metal extraction by H106 and the stability constants of extracted species have also been studied. H106 is a weak monobasic acid with superior stability and extractability. It forms internal complexing salts with metal ions

[Continuation of JINSHU XUEBAO No 4, Apr 82 pp 221-234]

under testing conditions through oxygen-oxygen coordination. The order of extractability of metal ions is in agreement with order of cumulative stability constants of metal complexes. It shows excellent selectivity in extraction under certain conditions. H106 gives very satisfactory results in recovery of Ga and Ge from H_2SO_4 leach liquor of residue of hydrometallurgical Zn refinery, and may also be used in the determination of micro-quantities of Ti as well as in many other fields.

9717
CSO: 4009/309

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ORG: None

TITLE: "Discussion on the Types of Underground Garages Suitable for China"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGROUND ENGINEERING] in Chinese No 2, 11 Feb 82 pp 8-13

ABSTRACT: In China, there has been very little experience concerning the advantages and shortcomings of various types of underground garages. For the purpose of deciding the type or types that are suitable for the actual condition of China, foreign experiences should be beneficial. From the point of view of application, there are pubic garages, special vehicle garages, and storage garages. From the construction point of view, there are the attached, detached, single story, multi-story, etc. types. From the way vehicles are transported in and out of the garages, there are graded and mechanically transporting garages. The reason for the construction of a very large number of garages in foreign countries is to provide temporary parking for private cars. At present, there are no private cars in China; therefore, there is no need to build public underground garages. The majority of Chinese cities are old, with no modern urban administrative measures and very narrow streets. Parking is becoming increasingly a serious problem. If underground garages are to be built at a very high cost, the possibility of using them as shelters during the time of war should also be taken into consideration. This paper introduces various foreign designs of underground garages, with comments concerning their suitability in China.

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ORG: None

TITLE: "Technical Discussion Meeting on Single-Track Railway Tunnel Ventilation"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGROUND ENGINEERING] in Chinese No 2 11 Feb 82 p 19

ABSTRACT: Sponsored by the Bureau of Science and Technology of the Ministry of Railways, a Discussion Meeting on the Ventilation Technique of Single-track Railway Tunnels was held on 9-11 Dec 81. Participants included 25 delegates representing The Basic Construction Bureau, the Academy of Survey and Design No 1, 2, 3, and 4, the Bureau of Tunnel Engineering, the Southwest Research Institute of the Academy of Sciences, [all above of the Ministry of Railways] and the Southwest University of Transportation. Among the subjects discussed at the meetings are there are inquiry into the piston Action of a train in the tunnel, computation of ventilation requirement of single-tract railway tunnel, theory and experiment of vertical tunnel ventilation, experiment on vertical ventilation of individual sections of a long tunnel and the method of computation. Experiments and studies on the safety and energy saving aspects of curtain-type ventilation device, signal interlock devices, etc. are suggested. The discussion meeting was held at the Southwest Research Institute of the Academy of Railway Science and Technology, in Emei, Sichuan Province.

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